

Ethernet Frame 311  
with IP Datagram as Data

Fig 3

FIGURE 1

High Freq.

Channel 403(0)

.

Channel 403(m)

Super Frame 404

Low Freq.

Super Packet 407(1)

407(n)

SPNR  
404

STRID415

STRID413

SPNR  
409

Data 411

RF Medium  
401

Data 404  
on  
Channel  
403(0)

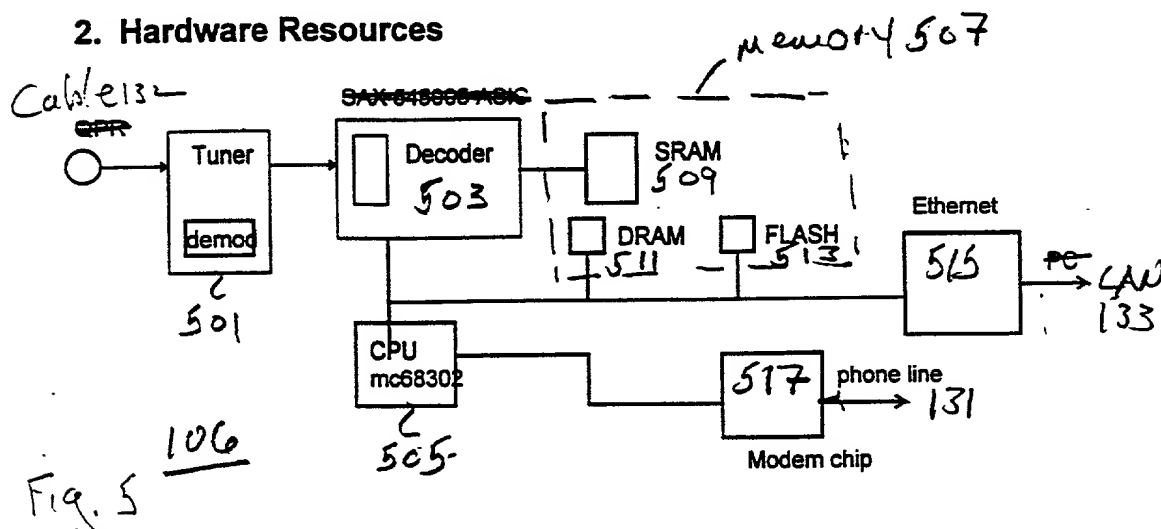
FIG 1

## 1. Introduction

This document describes the software characteristics of the cable modem used in Scientific Atlanta's *Cable Data Network Architecture*. The cable modem will provide asymmetrical transport using Quadrature Partial Response modulation downstream with upstream data provided by an integral telco-based modem. The connection to the host PC is provided by an Ethernet interface. Since the modem contains a telco modem, an additional mode of operation is as a standard AT command set modem when used with a Scientific Atlanta supplied device driver.

This modem will capitalize on several existing technologies already developed at Scientific Atlanta, most notably Digital Music Express (DMX), and SEGA product lines. In order to hasten the deployment of the modem, an operating system is being purchased from Microtec Research.

## 2. Hardware Resources



The Scientific Atlanta Cable Modem has several key hardware components that the software will accommodate. The three outside interfaces to the cable modem are the QPR/cable-TV coax, the ethernet port going out to the user network (probably a user PC), and the telephone company modem.

In order to support the three interfaces, there are a number of support components. On the cable /RF side of the box there is a tuner/demodulator which has been previously developed by SA for use in the SEGA project. This tuner/demodulator takes a QPR signal which arrives over a coaxial cable from the cable head end and produces a usable digital stream. This digital stream is passed to the SAX 545005 ASIC which digitally decodes the stream, which includes de-interleaving on multiple levels and decoding the BCH error correction encoding. For more information on how the SAX chip works, see the SA internal documentation titled "Design Requirements Document for the Sega ASIC for 32X-Cost Reduction (SAX-CR)".

In addition to the SAX chip the cable modem motherboard is equipped with a MC68302 general processor, which is connected to most of the other major components via a board level bus. This CPU will be running a real-time operating system called VRTX from Microtec Research. The CPU

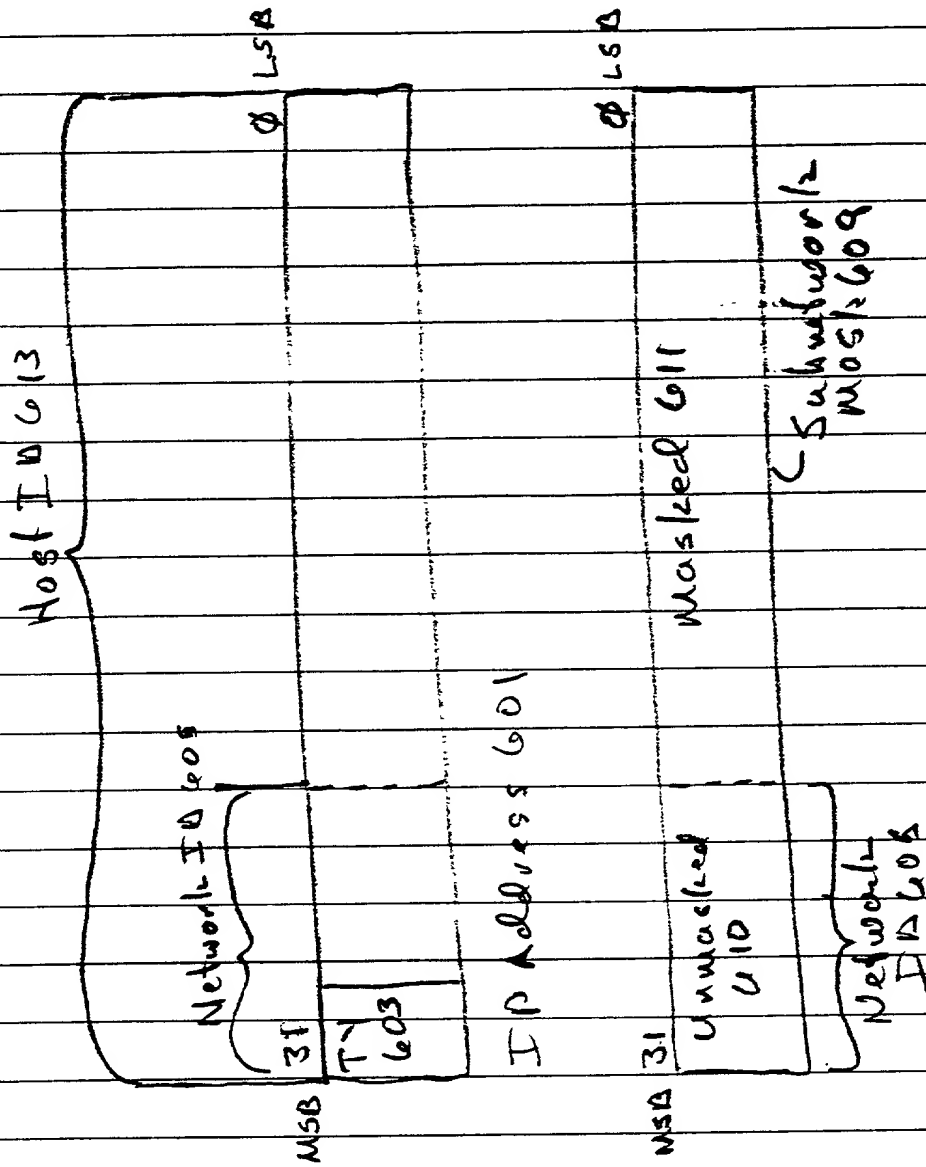


Fig. 6

Figure 11: Scenario D

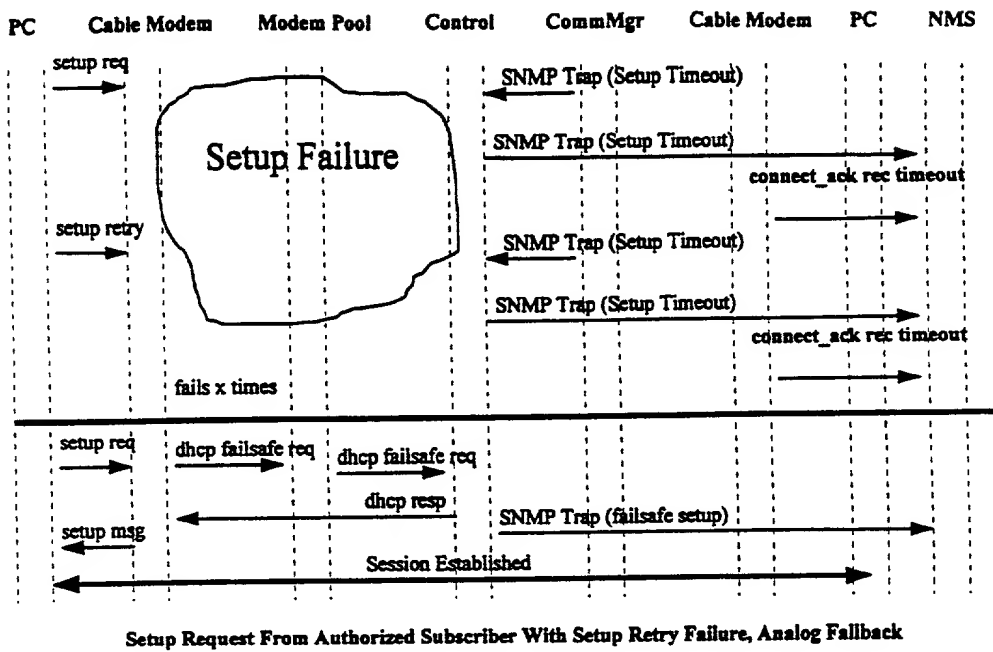
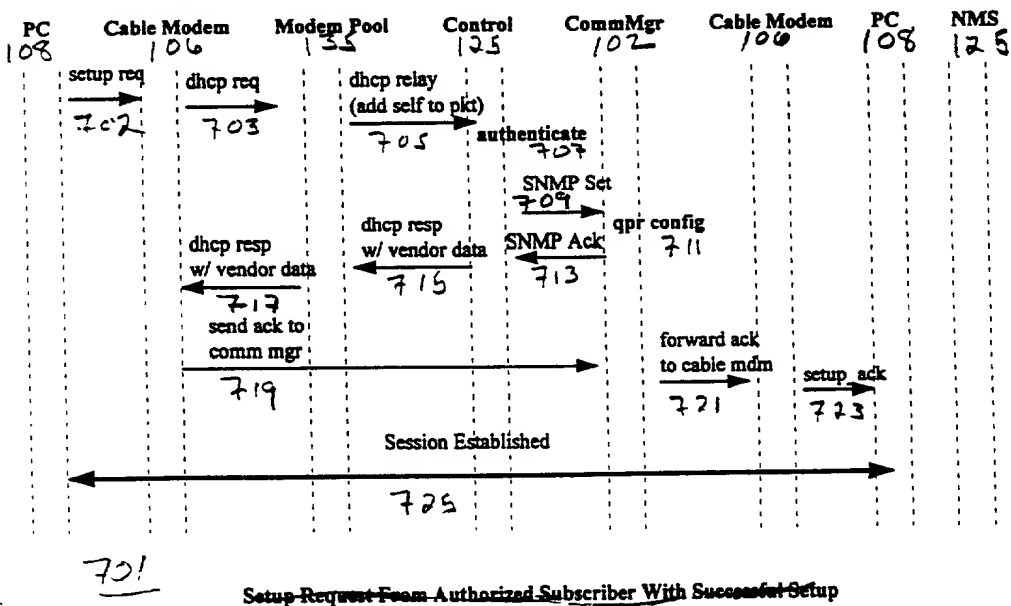


Figure 12: Scenario E



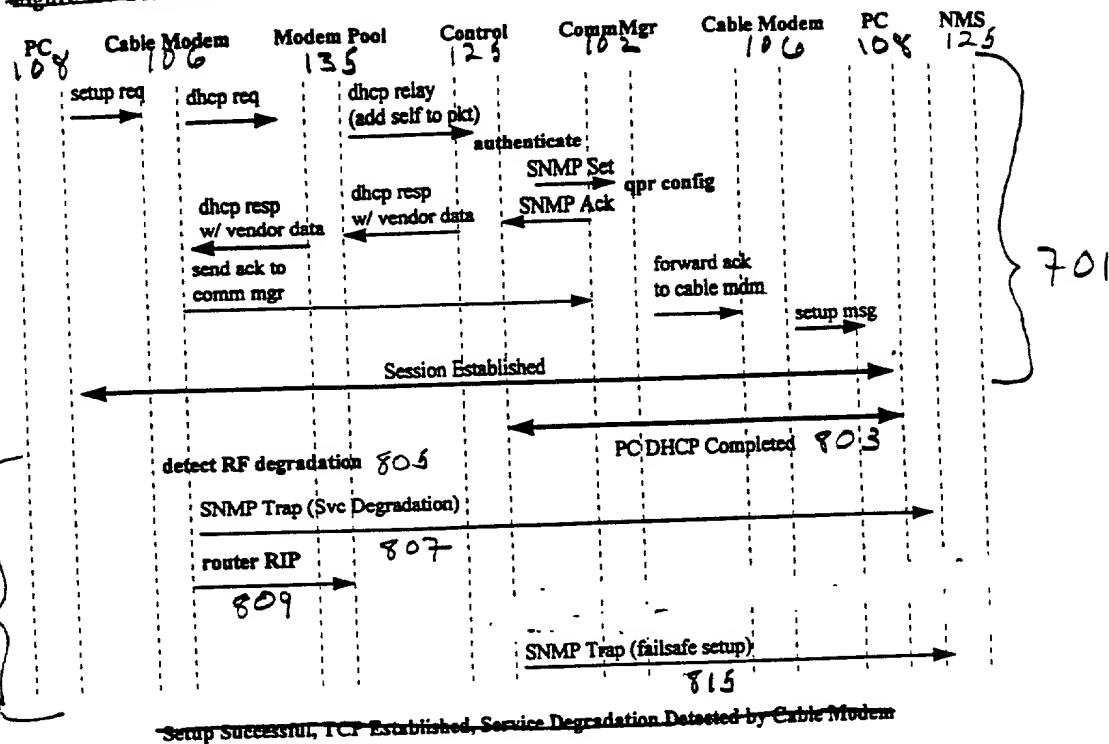
~~Figure 13 Scenario F~~

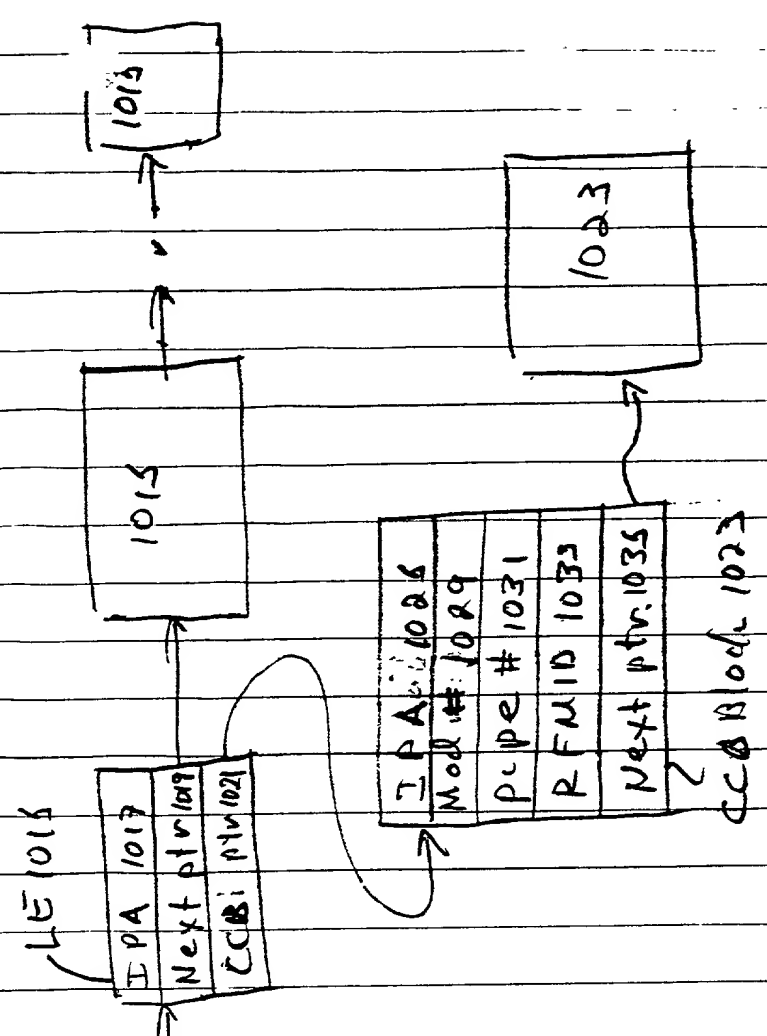
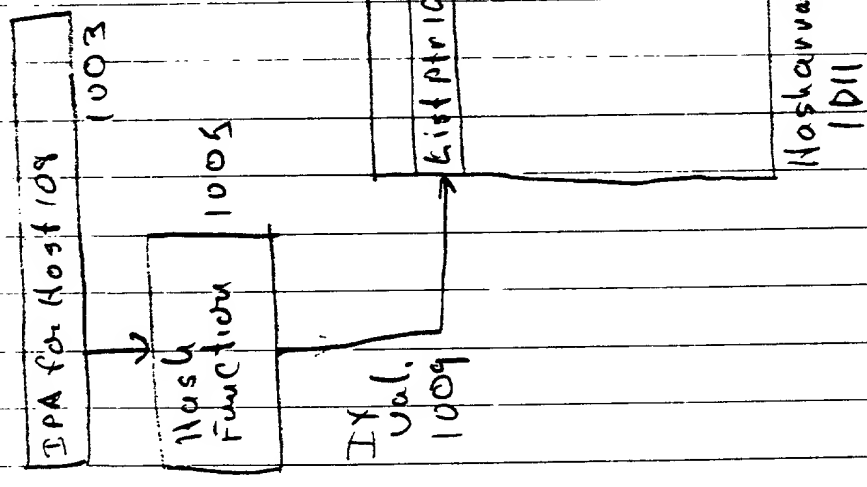
Fig. 8



	Dest IP	Gateway IP	Routing Info
903(c)	<u>906(c)</u> N/A <del>913</del> 915 917	IPA 203(c) 916	"
903(j)	N/A N/A N/A N/A	IPA 214(c) 919	"
<u>901 Routing table for Router</u>			
911 -	Dest IP	Gateway IP	Routing Info
922(i)	<u>HOST IP</u> 929	IPA 214(c) 931	"
922(j)	IPA 214(c) 930	IPA 214(c) 932	"
<u>921 Routing table for Modem Pool</u>			

Dest IPA	Gateway IPA	Routing Info
IPA for Host 108(9)	IPA for Host Host 108(9)	LAN 33
IPA for Host 108(9)	IPA for Host Host 108(9)	LAN 33
Default 115	Gateway IPA 203(c)	Routing Info
936(1)	947	
936(2)	947	
936(3)	947	
936(4)	947	
936(5)	947	
936(6)	947	
936(7)	947	
936(8)	947	
936(9)	947	
936(10)	947	
936(11)	947	
936(12)	947	
936(13)	947	
936(14)	947	
936(15)	947	
936(16)	947	
936(17)	947	
936(18)	947	
936(19)	947	
936(20)	947	
936(21)	947	
936(22)	947	
936(23)	947	
936(24)	947	
936(25)	947	
936(26)	947	
936(27)	947	
936(28)	947	
936(29)	947	
936(30)	947	
936(31)	947	
936(32)	947	
936(33)	947	
936(34)	947	
936(35)	947	
936(36)	947	
936(37)	947	
936(38)	947	
936(39)	947	
936(40)	947	
936(41)	947	
936(42)	947	
936(43)	947	
936(44)	947	
936(45)	947	
936(46)	947	
936(47)	947	
936(48)	947	
936(49)	947	
936(50)	947	
936(51)	947	
936(52)	947	
936(53)	947	
936(54)	947	
936(55)	947	
936(56)	947	
936(57)	947	
936(58)	947	
936(59)	947	
936(60)	947	
936(61)	947	
936(62)	947	
936(63)	947	
936(64)	947	
936(65)	947	
936(66)	947	
936(67)	947	
936(68)	947	
936(69)	947	
936(70)	947	
936(71)	947	
936(72)	947	
936(73)	947	
936(74)	947	
936(75)	947	
936(76)	947	
936(77)	947	
936(78)	947	
936(79)	947	
936(80)	947	
936(81)	947	
936(82)	947	
936(83)	947	
936(84)	947	
936(85)	947	
936(86)	947	
936(87)	947	
936(88)	947	
936(89)	947	
936(90)	947	
936(91)	947	
936(92)	947	
936(93)	947	
936(94)	947	
936(95)	947	
936(96)	947	
936(97)	947	
936(98)	947	
936(99)	947	
936(100)	947	

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Routing Info

Dest. IP	Gateway IP	Routing Info
Loop back IP 103	Loop back IP 103	
IP for Host 108 (104)	IP for Host 108 (101)	10133
.	.	105
.	.	.
IP for Host 108 (101)	IP for Host 108 (101)	105
Default 1115	Reusable IP for RF Module 106 (111)	1105

1103 (1)

1104

1103 (1)

Routing table 1101  
for Host 108 (12)

IP	LAN A
IP for Host 108 (101)	LAN A for Host 108 (101)
112 (101)	112 (101)
.	.
112 (101)	112 (101)
Reusable IP for RF Module 106 (111)	LAN A for RF Module 106 (111)
117	1125
ARP Cache for Host 108 (12)	

112 (1)

112 2

Fig. 11

